



# UNITED STATES PATENT AND TRADEMARK OFFICE

*an*

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,050	08/18/2003	James Herbert Kukula	06816.0504	3579

35795 7590 09/15/2006

JONATHAN T. KAPLAN  
ATTORNEY AT LAW  
10800 SE 17TH CIRCLE  
SUITE E66  
VANCOUVER, WA 98664

EXAMINER

ROSSOSHEK, YELENA

ART UNIT PAPER NUMBER

2825

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/643,050

Applicant(s)

KUKULA, JAMES HERBERT

Examiner

Helen Rossoshek

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 11-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/1/06
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. 20060907.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. This office action is in response to the Application 10/643,050 filed 08/18/2003.

2. Claims 1-17 are pending in the Application.

***Election/Restrictions***

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-10, drawn to a method for solving constraints during functional verification, classified in class 716, subclass 5.
- II. Claims 11-17, drawn to a method for image computation, classified in class 716, subclass 5.

4. Inventions Group I and Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because a method for image computation is subcombination of the combination, such as a method for solving constraints in the process of functional verification of a representation of an electronic design of an integrated circuit. The subcombination has separate utility such as the method for image computation.

5. The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims

Art Unit: 2825

thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

6. The inventions are distinct, each from the other because of the following reasons:

Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions **require a different field of search** (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Jonathan Kaplan (Registration No. 38,935) on 09/01/2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Specification***

8. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally **limited to a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

9. The disclosure is objected to because of the following informalities: the information regarding Application related to the instant Application must be updated, such as Publication number or Patent number, if it exists.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

10. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 1-8, 10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, wherein an electromagnetic waveform is not a proper useful process, machine, manufacture or composition matter.

***Claim Objections***

12. Claims 1, 2, 7, 9, 10 are objected to because of the following informalities: it is not clear what the term "unioning" means. Is it union?

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hulgaard et al. ("Equivalence checking of combinational circuits using Boolean expression diagrams", July 1999, Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions on, Volume 18, Issue 7, Page(s): 903 – 917).

With respect to claims 1, 2, 9 and 10 Hulgaard et al. teaches an electromagnetic waveform comprising a computer program, the computer program for solving constraints during functional verification of representation of an electronic design of an integrated circuit (IC) (within a number of computer-aided design (CAD) applications related to validating the correctness of a circuit design (Page 903, left column), the computer program comprising the following steps when executed by a data processing system: selecting a first set of block-related constraints, from a first set of constraints, according to a first block (within obtaining/selecting a pair of two nodes/vertexes in a OBDD for further checking/verifying (Page 905, right column), wherein variables in the

Art Unit: 2825

OBDD are related to the different set of rules/constraints (Page 909, left column) for corresponding circuits/blocks under consideration (Page 909, right column)); identifying a first set of non-block-related constraints, from the first set of constraints, not selected for the first set of block-related constraints (Page 909, right column); conjoining the first set of block-related constraints to produce a first solution generator (as shown on the Figures 5 and 5 on the Page 907); existentially quantifying the first block from the first solution generator to produce a first new constraint (Page 906, left column); unioning the first new constraint and the first set of non-block-related constraints to produce a second set of constraints \*Figures 4, 5, Page 909, right column); selecting a second set of block-related constraints, from the second set of constraints, according to a second block (Page 909, right column); conjoining the second set of block-related constraints to produce a second solution generator (Page 909, left column); solving the second solution generator (Page 909, right column); and solving the first solution generator using a second result of solving the second solution generator (Page 909, right column).

With respect to claims 3-8 Hulgaard et al. teaches:

Claim 3: further comprising: defining a partition, including the first block, prior to selecting a first set of block-related constraints (Page 916, right column; Figure 2, Page 904, right column);

Claim 4: further comprising: defining a partition, including the second block, dynamically by applying a metric to the second set of constraints (Figure 2, Page 904, right column);

Claim 5: further comprising: introducing at least one auxiliary variable, prior to the step of selecting a first set of block-related constraints, in order to reduce a complexity of at least one constraint contained in the first set of constraints (by introducing a new variable (Page 906, left column; Page 906, right column);

Claim 6: wherein the first block does not contain state variables (as shown on the Figures 2, 3, 4 and 5 variables do not represent a state 0 or 1);

Claim 7: further comprising: successively repeating the steps of existentially quantifying (Page 906, left column; Page 909, left column), identifying and unioning on a current set of constraints to produce a next set of constraints, and selecting and conjoining on the next set of constraints according to a next block, until there is no next block (as shown on the Figures 4 and 5; Page 909, left column);

Claim 8: further comprising: existentially quantifying the second block from the second solution generator to produce a second new constraint (Page 906, left column); and successively repeating the steps of identifying and unioning on a current set of constraints to produce a next set of constraints, and selecting, conjoining and existentially quantifying on the next set of constraints according to a next block, until there is no next block (Page 909, left column).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen Rossoshek whose telephone number is 571-272-1905. The examiner can normally be reached on 7:30-4:30.

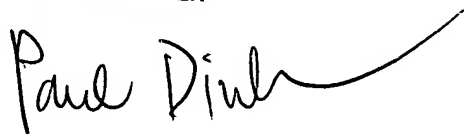


Art Unit: 2825

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PAUL DINH  
PRIMARY EXAMINER



Examiner  
Helen Rossoshek  
Art Unit 2825

